



CRITICAL | **ECOSYSTEM**
PARTNERSHIP FUND

Siamese Crocodile: icon for the restoration of the Sekong River

**Siem Pang Wildlife Sanctuary, Stung Treng province,
Cambodia**

**Environmental Impact Assessment
and
Environmental Management Plan**



February 2022

CEPF Grant 110291

Rising Phoenix Co. Ltd.

Grant Summary

1. Rising Phoenix Co. Ltd.
2. Siamese Crocodile: icon for the restoration of the Sekong River.
3. CEPF 110291
4. US\$ 180,000
5. 1 March 2020 to 30 June 2022
6. Cambodia
7. Document prepared on 24 February 2022

8. Project Summary

The project is working within Siem Pang Wildlife Sanctuary (SPWS), Siem Pang District, Stung Treng Province, Cambodia, with a focus on the Sekong River and its tributaries. The project aims to promote sustainable fisheries management along the waterways, and sufficient ecological restoration to permit a Siamese crocodile population reinforcement.

This environmental impact assessment and management plan relates to the Siamese Crocodile population reinforcement component only.

9. Status of area to be impacted

Siem Pang Wildlife Sanctuary (SPWS), is a globally irreplaceable site located in the Northern Plains Seasonally Inundated Forest and the Sekong River, part of Mekong River 3S Rivers Confluence which flows through the site. SPWS extends across over 1,300 Km², comprising deciduous dipterocarp forest, and semi-evergreen forest, with the Sekong River and its tributaries draining the site. The site supports breeding populations of five Critically Endangered bird species (*Thaumatibis gigantea*, *Pseudibis davisoni*, *Gyps tenuirostris*, *Gyps bengalensis* and *Sarcogyps calvus*), as well as the largest known population of the Endangered Eld's deer *Rucervus eldii siamensis*, making the site unique.

The Sekong River is a major tributary of the Mekong River and remains the last undammed major river in Cambodia. Within SPWS it supports tracts of pristine riverine forest that hold a major population of the Endangered Green Peafowl *Pavo muticus* and Indochinese Silvered Langur *Trachypithecus margarita*. Globally threatened aquatic fauna includes the Critically Endangered Asian Giant Softshell Turtle *Pelochelys cantorii* and Vulnerable Asiatic Softshell Turtle *Amyda cartilaginea*. The Critically Endangered Siamese crocodile *Crocodylus siamensis* is reported to still remain in low numbers and the last documented record prior to research undertaken under this project was in 2006 (Simpson & Sam 2006).

Within Siem Pang Wildlife Sanctuary the Sekong River and its tributaries are subject to high levels of illegal fishing. Unregulated gill netting is widespread on the Sekong and larger rivers and has impacted and depressed fish and reptile populations. Local communities currently have unrestricted access to SPWS, although the Government has approved a zonation plan for the site, whilst the boundary demarcation process began in 2021.

10. **Approach:** This section will describe proposed actions during the project. Specifically, what do you intend to do and how will you do it?

An output of the CEPF 65870 assessed species rewilding opportunities at SPWS (Gray *et al.* 2019). This paper identified the Siamese crocodile as a leading candidate species for population reinforcement, since it was not considered extinct at SPWS. This evaluation was based upon a ranking system which took into account global threat status, ecosystem service roles, charisma, and aspects of practicality such as opportunities for sourcing founders from Cambodia (Gray *et al.* 2019). Guided by the recommendations of this paper, we developed the current project designed to result in a Siamese crocodile reinforcement at SPWS.

We conducted a Siamese crocodile survey, assess the suitability of the habitat, evaluate threats and plan the re-enforcement exercise. In 2020, two surveys were implemented in conjunction with Fauna and Flora International (FFI) who have an established track record of leading Siamese crocodile research and reinforcement and reintroduction projects. The first survey was implemented in June 2020 during the early rainy season whilst water levels were low and in December 2020 when water levels were falling. These times were chosen to maximize the chances of finding Siamese crocodile dung, tracks and basking areas. The first survey found tracks and impressions made by a crocodile leaving the water confirming the continued presence of Siamese crocodile at SPWS although in very reduced numbers and restricted to remote parts of the river system in SPWS (Sinovas *et al.* 2020). The authors considered that this population was not viable due to its small size and that it would not be able to recover without population reinforcement, coupled with strengthened site protection.

Following the completion of the second survey, a habitat survey and reintroduction feasibility assessment was undertaken (Sinovas *et al.* 2021). This assessment followed internationally accepted guidelines for species reintroductions and translocations (IUCN 2013). The assessment concluded that suitable habitat for the release of Siamese crocodile remained within SPWS along the upper reaches of the O'Khampa and Tin Hiang rivers. It determined that crocodile hunting, historically the main driver of the species decline, was no longer a threat. In addition, the increased law enforcement capacity a measured by an increase in the absolute number of rangers, ranger patrols, ranger training and enforcement management were important mitigating factors on the continued fishing pressure and habitat degradation. The report identified areas with suitable habitat and low levels of disturbance, and noted that crocodiles that disperse outside the protected area would face an uncertain future (Sinovas *et al.*, 2020).

Based on Sinovas *et al.* (2021) we developed the SCARE Campaign (Siamese Crocodile, Awareness, Release, Enforcement). The objectives of the SCARE Campaign were incorporated into the monthly patrol plans for Law Enforcement and Scout teams as prepared by the Surveillance, Intelligence and Reporting Unit. The effectiveness and impact of these patrols are evaluated in the monthly law enforcement reports.

As part of SCARE activities we evaluated local support for Siamese crocodile re-enforcement. The project has support from the Deputy Provincial Governor, who had been impressed by Nile crocodiles *Crocodylus niloticus* whilst on a study tour to observe devolved park management at Majete Game Reserve in Malawi. We conducted a consultation at Kampourk village, the closest to the site, which had previously had a crocodile cult and for which the Siamese crocodile was the totem animal. Previously for example a crocodile banner was displayed in the village pagoda. We also noted the existence of a derelict spirit house dedicated to Siamese crocodile worship at one of the proposed release sites and the opportunity it presents for reviving the crocodile cult.

An rapid assessment of the release sites proposed in Sinovas *et al.* 2020 and Sinovas *et al.* 2021, was undertaken by leading crocodile expert Dr. Steve Platt in July 2021 in SPWS, which confirmed Boueng Nava and Boueng Khampa as preferred sites (Platt 2021). Boueng Nava (Lake of crocodiles) is an oxbow lake extending over approximately 2 ha, densely vegetated with sedges and grass, which holds water throughout the dry season and is located about 450 m from the O'Khampa River. Boueng Khampa is also a large wetland dominated by dense stands of tall sedges, although it was recommended that Boueng Khampa required some habitat restoration including deepening and the creation of small islands adjacent to deep pools, and that this habitat management would need to be taken one year before release.

Following Platt (2021) a soft release enclosure will be constructed at Boueng Nava in February 2022. The enclosure will measure 26x12 m, with a height of the enclosure 0.8 m above the ground/water level. It is designed to provide access to the water and the banks. The lake section of the enclosure will be made from a framework of bamboo poles covered by plastic fine mesh screen. The bamboo posts and netting will be buried into the bed of the lake to prevent burrowing. The bank section of the enclosure will be made from metal fencing mesh secure by bamboo posts. The metal fence will be dug approximately 40 cm into the ground to prevent burrowing.

In March 2022, 15 large juvenile crocodiles (> 2m in length) will be moved from their current quarantine facility at Angkor Animal Kingdom to the soft release enclosure where they are expected to remain for three months until the rising water levels facilitates their escape from the enclosure. This period will allow the crocodiles to adapt to their new home, and minimize the risk of them wandering away from the release site once free. A camp will be established at the soft release site to monitor their condition and to advise fishermen and prevent theft. This camp will be manned 24 hours per day, for the entire duration of the soft release period by a combination of Department of Environment rangers, scouts, and members of the Biodiversity Monitoring Unit and Logistics Support Unit of Rising Phoenix.

Supplementary feeding will be provided to the crocodiles when they are in the soft release enclosure, and post monitoring release is planned to continue into the long term to monitor the success of this pilot release.

11. **Anticipated impact:** This section will describe the impact and how this impact has been determined.

If successful this Siamese crocodile reinforcement will enable the crocodile population to recover and thereby improve ecosystem function. The recovery of the population of an apex predator, in this case the Siamese crocodile will lead to a trophic cascade resulting in the restoration of balance in the fish population. In time this may result in greater harvestable fish biomass in the Sekong River which could have positive food security impacts for local communities.

An established and visible population of an apex predator will have tourist value once tourist infrastructure is in place. Thus the reestablishment of this species will have future economic value.

With the participation of local communities the project will help restore traditional cultural practices in relation to the revival of the crocodile cult, restoring pride and create stakeholders for the conservation of the site.

The project will assist the Government of Cambodia meet its obligations under Article 8. In-situ Conservation of the Convention on Biological Diversity.

The publication of a paper on the project will inform the dialogue on re-wilding and species re-introductions in Cambodia.

12. **Mitigation measures:** Describe measures that will be taken to mitigate negative impacts.

The 15 crocodiles selected for release, were chosen by Joe Rose who manages the FFI Siamese crocodile facility at Phnom Tamao Zoo, from a crocodile breeder in Siem Riep with whom he was personally acquainted and recommended. The selected crocodiles were micro-chipped to enable individual identification. They were then DNA tested by a laboratory in Phnom Penh with an established track record to ensure they are 100% Siamese crocodile and not hybrids. This will mitigate the risk of hybrids being released into SPWS.

The 15 crocodiles selected for release, were quarantined in at Angkor Animal Kingdom an entirely new facility for five months, where their health has been monitored by the Curator of Reptiles, Mark Dainty who has previous experience in crocodile care. This mitigates the risk of disease transmission into the SPWS aquatic ecosystem, which could impact the existing population of Siamese crocodiles.

A crocodile transportation protocol will be followed to ensure the crocodile welfare is maintained during transport to SPWS. This is the same protocol which has been effectively implemented by FFI in transporting crocodiles without resulting deaths.

The design of the soft release enclosure follows established designs used by the Wildlife Conservation Society in Laos. This mitigates the risk of the crocodiles injuring themselves in the enclosure. The soft release protocol has also been designed to prevent the crocodiles dispersing wildly upon release, to reduce the chance of them dispersing outside SPWS where threat levels are higher.

Rising Phoenix has worked with local communities and key government stakeholders, in each step of the project to advise them of risks, impacts and benefits. The soft release site is within the conservation zone of SPWS, signboards have been installed which highlight that this is a crocodile release area, and which activities people should not engage. Sign boards have also been installed at key points at villages surrounding SPWS. These actions mitigate the chance of local communities being unaware of the project, or of any illegal crocodile hunting.

13. **Actions to ensure health and safety:** Describe actions that will be taken to ensure the health and safety of workers as well as the site. Include a description of waste management and/or disposal.

One of the reasons Siamese crocodile was selected for re-enforcement was that the risks of harm or injury to humans is low. There is no documented case, as far as we are aware of wild Siamese crocodile attacking or injuring humans. Indeed an example of peaceful co-existence between people and Siamese crocodiles was brought to our attention at Xe Champhone Ramsar Site in Laos where villagers swim in pools inhabited by large Siamese crocodiles (Steve Platt verbally 2021).

A second reason for genetic testing was to remove the risk of hybrid crocodiles which may have a more aggressive disposition, especially if hybridized with saltwater crocodiles *Crocodylus porosus*.

Mark Dainty an experienced crocodile handler will be used in the capturing, transport and transfer of the crocodiles from Angkor Animal Kingdom to Boueng Nava in SPWS. This utilization of expert handlers will reduce the risk of injury to people and crocodiles.

The large size of the soft release enclosure mitigates crocodiles causing injury to one another.

The presence of a temporary patrol base at Boueng Nava, staffed 24 hours per day will mitigate the risk of crocodile theft or hunting or damage to the enclosure.

Once the soft release is complete any plastic or re-usable materials will be scavenged from the enclosure and re-cycled or disposed of. All plastic, glass and metal waste will be removed from the camp and organic waste will be buried.

14. Monitoring and evaluation: This section aims to outline what steps the proponent will take to monitor and evaluate the impact of the proposed intervention.

Five or 33% of the Siamese crocodiles will be fitted with satellite trackers to determine survival and dispersal. They will be monitored using the Earth Ranger system which is routinely used by Rising Phoenix.

Regular patrols will be conducted at the release site and along the O'Khampa River by the Biodiversity Monitoring Unit and will be recorded in the monthly biodiversity reports.

Quarterly village forums will be held will highlight any encounters between locals and the crocodiles especially in relation to fisheries bycatch.

15. Permission of the landowner: Please verify permission of the landowner to undertake actions on the site, and verify that you have the required permits to undertake this work.

The Ministry of Environment has mandated that Siem Pang Wildlife Sanctuary is under the jurisdiction of Stung Treng Department of Environment. Rising Phoenix operates in SPWS under both Letters of Agreement with the Ministry of Environment and with Stung Treng Provincial Authority.

Both Phan Yuth (Siem Pang District Governor) and Chea Heng (Head of Stung Treng Department of Environment) have endorsed this project.

16. Consultation: This section aims to outline the range of informed consultations that the grantee has had both with experts to optimize the potential for success, and with stakeholders, particularly local communities, who are potentially affected by the proposed actions. Include dates of consultations.

The project has worked with Crocodile experts from both FFI, WCS and Angkor Animal Kingdom. These include:

Mark Dainty, Curator of Reptiles, Angkor Animal Kingdom

Assisted with purchase and micro-chipping and manager of Siamese crocodiles during quarantine.

Lonnie McCasKil, Assistant Director and Curator of Animals at Prospect Park Zoo, Florida, Wildlife Conservation Society and IUCN Crocodile Specialist Group
One meeting in Phnom Penh during project design

Ouk Vibol, Director, Department of Fisheries Conservation, Fisheries Administration, Ministry of Agriculture, Forestry and Fisheries

Dr Steven Platt, Resident Herpetologist WCS, IUCN Crocodile Specialist Group
One site visit in 2021 and a short report produced. Regular email correspondent.

Joe Rose, Captive breeding project officer for FFI's Siamese Crocodile Project
One meeting at the Siamese Crocodile Project HQ at Phnom Tamao Zoo in 2020. Led the team to select crocodiles from a breeder in 2021.

Dr Pablo Sinovas, Flagship Species Manager, Fauna and Fauna International
Led two field trips to SPWS in 2020 and 2021. Produced three written reports. Regular email correspondent.

Sreng Cheaheng, Director Stung Treng Department of Environment
Monthly meetings since his appointment in 2021.

Phan Yuth, Governor Siem Pang District
Monthly meetings since 2020.

Since project inception a number of consultations have been held with the local community and key stakeholders via quarterly village and stakeholder forums. Key stakeholders include the deputy Stung Treng Provincial Governor, Siem Pang District Governor, Head of the Provincial Department of Environment, Prek Meas and Thmor Keo Commune Chiefs, Khes Sway, Khes Krom, Pong Kriel, Nhang Sum, Lakay, Phabang and Kham Pouk Village chiefs, as well as representatives from different law enforcement agencies including the Police, Border Police, Army, and Royal Gendarmerie.

Consultations have included:

- A project launch workshop on 16 June 2020 in the Siem Pang District Hall.
- Meetings held with two Community Based Organizations on the Sekong River, and Khet Svey villages in June 2020, which included gathering key informant information on Siamese crocodiles, and discussing the project objectives
- A stakeholder forum was held in September 2020, to update key stakeholders on the rediscovery of Siamese crocodile at SPWS. Discussion was held in relation to the development of an enforcement protection plan for the crocodile habitat.
- Key informant interviews were held in Khampourk village in December 2020, and further discussion were held with key villagers in March 2021.
- A stakeholder forum was held in June 2021, where the SCARE campaign was presented to the attendant and received their agreement and support.
- In September 2021 village forums were held in Prek Meas and Thmor Keo to raise awareness on the Siamese crocodile project, to promote positive behavior towards the existing and future released crocodiles

17. **Disclosure:** CEPF requires that safeguard documents are disclosed to affected local communities and stakeholders prior to project implementation. Please describe efforts to disclose this impact assessment and environmental management plan and provide dates.

A Launch workshop was held for the project in June 2020. This presented the purpose and expected results of the project, as well as providing an opportunity for the attendants to provide input into the project design and for them to express any concerns or feedback.

A grievance mechanism was produced for the project, in three languages including Khmer, English and Lao. A poster for each language was printed and distributed across seven villages, in three communes at a total of 26 locations. Also a letter box was set up at the three commune halls to provide an additional method for stakeholders to express any grievances, recommendations or suggestions.

A stakeholder forum will be held in March 2022 to present the management plan to key stakeholders before the Crocodile are moved to the soft release enclosure.

18. **Grievance mechanism:** All projects that trigger a safeguard must provide local communities and other relevant stakeholders with a means to raise a grievance with the grantee, the relevant regional implementation team, the CEPF Secretariat or the World Bank.

Rising Phoenix Co. Ltd.

Siamese Crocodile: icon for the restoration of the Sekong River.

Siem Pang Wildlife Sanctuary, Cambodia

Grievance mechanism

To Whom It May Concern

This document provides a grievance mechanism in relation to the above-named project.

Stakeholders will be informed of the objectives of the project and the existence of the grievance mechanism via a public notice posted outside the Rising Phoenix office Siem Pang in Khmer, Lao and English languages. Stakeholders will further be made aware of the objectives of the project and the existence of the grievance mechanism via notices available at project meetings and public announcements at village meetings in Khmer.

Rising Phoenix will share all grievances – and a proposed response – with the Regional Implementation Team and the CEPF Grant Director within 15 days. If the claimant is not satisfied following the response, they may submit the grievance directly to the CEPF Executive Director at cepfexecutive@conservation.org.

If the claimant is not satisfied with the response from the CEPF Executive Director, they may submit the grievance to the World Bank at the local World Bank office.

Any signboards and posters created as a project output will contain the contact information for Rising Phoenix and CEPF as provided below. Anyone wishing to communicate with the grantee and the

CEPF Regional Implementation Team on matters relating to this project may do so via the following contact information:

Rising Phoenix, 32 A, 494 Sangkat Phsar Daeum Thkov, Phnom Penh, Cambodia.
Telephone: +855(0) 89244927
Email: admin@birdlifecambodia.org

Lou Vanny
CEPF Regional Implementation Team
IUCN
Room 592, 5th Floor, Phnom Penh Centre,
Sothearos Boulevard, Sangkat Tonle Bassac, Phnom Penh, Cambodia.
Telephone +855 12 703 033.
Email: Vanny.lou@iucn.org

CEPF Executive Director: cepfexecutive@conservation.org

19. References

Gray, T.N.E., Eames, J.C., Lyon, J.R.A., Meyerhoff, M. (2019) Rewilding in Southeast Asia: an assessment of conservation opportunities in Western Siem Pang Wildlife Sanctuary, Cambodia. *Cambodian Journal of Natural History*, 2019, 98-112.

IUCN/SSC (2013) Guidelines for Reintroductions and Other Conservation Translocations. Version 1.0. Gland, Switzerland: IUCN Species Survival Commission, viiii + 57 pp.

Platt, S. G. (2021) Assessment of Potential Release Sites and a Reintroduction Protocol for Siamese Crocodiles in Siem Pang Wildlife Sanctuary, Cambodia. Unpublished report to Rising Phoenix.

Simpson, B.K. and Sam, H. (2006) A rapid Siamese crocodile survey in the upper Sekong river, Stung Treng, Cambodia. FFI Cambodia and Forestry Administration, Phnom Penh.

Sinovas, P., Sam, H., Hor, L. (2020) Siamese crocodiles habitat survey of Siem Pang Wildlife Sanctuary. A report by Fauna & Flora International in collaboration with Rising Phoenix. Phnom Penh, Cambodia.

Sinovas, P., Sam, H., Hor, L. (2021) Siamese crocodiles in Siem Pang Wildlife Sanctuary: Habitat survey and reintroduction feasibility assessment. A report by Fauna & Flora International in collaboration with Rising Phoenix. Phnom Penh, Cambodia.